RESIDENTIAL STRUCTURED CABLING

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Residential structured cabling represents a fast growth market that no distributor or electrical contractor can afford to ignore. By 2004, it is forecast that more than half of all new homes in the United States will include a structured wiring system. If this prediction holds true, residential structured cabling will soon surpass today's commercial voice and data wiring market.

WHAT IS RESIDENTIAL STRUCTURED CABLING?

A residential structured cabling system, essentially, networks voice and data, audio and video, along with home security and environmental control.

A properly installed wiring system can support home theater with surround sound, whole-house audio, lighting automation, security requirements, appliance control, telephone, fax and other home office requirements and remote-access zoned environmental controls. Additional lifestyle options include driveway sensors, motion detection flood lights, automated drapes, pet doors and feeders, medical diagnostic monitoring, a wireless LAN, web cameras and voice telephony over an Internet protocol. In certain cases, stand-by power generators are also offered.

While some of these capabilities may seem like luxury items, structured cabling is also fast becoming a very real necessity for some. To professionals who work from their homes, for example, structured cabling is a necessity for a sophisticated home office.

WHAT ARE THE COMPONENTS?

If you are familiar with commercial networks, you are well on your way to understanding a home installation. The components, including the distribution center, cables and wall outlets, are virtually identical, however, smaller in scale.

The distribution center is a central panel or cabinet where services from outside the home (cable tv, telephone, satellite, high- speed Internet access, etc.) enter the house. The cabinets tend to be 14.5 inches wide so they can be recessed between wall studs on 16-inch centers. Typical cabinet heights range from 8 to 10 inches for condos, to 14 to 28 inches for standard homes and up to 40 inches for large homes. A minimum requirement for each cabinet is a telephone-connecting block for terminating the twisted pair, and a passive cable splitter for the coax. Room should be left for upgrade components, including patch panels for the voice and data lines, amplified splitters for cable, lighting controls, audio distribution panel, security panel, home automation components and

data hubs and routers.

In larger homes, a stand-alone cabinet or rack can be used if there is room for a dedicated telecommunications facility. To meet the requirements of TIA-570A, every structured cabling system needs to have a distribution device or cabinet. It should be centrally located and be as close as possible to the entry and demarcation points of the telephone and cable television service providers. In no case can the furthest outlet be located more than 492 feet from the demarcation point. The cabinet should be properly grounded and be within 5 feet from a duplex power outlet.

What about wiring? Although individual Cat 5e and RG-6 cables will service the various outlet configurations, specifically designed "multimedia" cables are being recognized as better solutions. A dual cable, for example, consists of one Cat 5e and one RG-6 under a single jacket. Another "composite" construction could include 2 Cat 5e 24/4 UTP cables for voice and data and 2 RG6 Quad shielded satellite grade coax cables tested to 2.4 GHz. These cables speed installation time because multiple cables can be pulled at the same time. It also minimizes termination times since all ends are readily identifiable.

It is very important that the installer test all cable runs from the cabinet to the information outlets at the completion of the pre-wire. Once the drywall is installed, it is very difficult and expensive to replace a marginal cable run. A basic test consists of continuity and wire map to T-568A on all four pairs of the Cat 5e, and continuity of the coax's inner and outer conductors.

WHAT DOES IT COST?

It is not unusual for a homeowner to choose a number of options resulting in a $10,000 wiring package. However, for a $500,000 home this adds only two percent to the purchase price and can be easily recouped at resale time. Similarly, a $2,500 system adds only two percent to the price of a $125,000 house.

Here's another factor driving this market: the homeowner can roll the cost of structured wiring into the tax-deductible home mortgage.

It is important to recognize that the term "residential structured cabling" implies to two distinct markets: the pre-wiring market for new construction, and the re-wiring market where, for example, a home office or a home theater is being installed.

Pre-wiring new construction to accommodate several phones and televisions can cost a homeowner as little as $500. Pulling the wires during construction is easy to do, relatively inexpensive, and it doesn't disturb the finished home. This basic system fixes the locations of telephones and

TVs in the home, and does not include a distribution center to facilities future upgrades. Including the distribution cabinet increases the cost to approximately $1,000, but allows for the inexpensive installation of additional information outlets at a later date.

Pre-wiring is much more successful if a centrally located distribution cabinet is used with home run cables running from it to information outlets located in every room. At least two outlets are recommended for the family room, den and master bedroom; other rooms should get at least one. While a smaller home may require only 8 to 12 outlets, a larger home may have dozens.

This type of pre-wiring may cost a homebuyer from $2,000 to $6,000 depending on the number of wired outlets and the module types installed in the cabinet. Modules can host a number of functions, such as security panel, connection to a telephone key system, amplified cable TV splits, data hubs, and Internet router and connections to audio systems, satellite receivers, DVD players and video surveillance cameras.

Re-wiring is another situation all together. Installing the wiring necessary for a home theater or office in an existing house takes creativity, skill and specialized tools. Installers need to determine the best routing for a variety of cable needs to minimize opening walls, as well as the subsequent replastering and repainting. The bill to re-wire a single room with several information outlets may run as high as $2,000 due primarily to labor.

WHO INSTALLS THE SYSTEM?
Three different groups of installers can do home wiring.

High-end custom homes normally retain the services of a CEDIA type system integrator who knows how to design a home theater or a home office, providing a turnkey solution. They'll do the wiring, install the speakers, set up the audio/video equipment; program home automation cycles and integrate a variety of stand-alone systems to work together.

Security dealers/installers do both pre-wire and re-wiring, bringing with them the experience in installing cables to difficult locations.

Electricians are rapidly entering the pre-wire structured cabling arena, primarily in newly developed communities. Electricians save time and money for the homebuilder because they install both the high- and low-voltage cables. Using trained electricians, builders can offer a basic structured wiring package that can be enhanced with options during the selection process.

Growth in structured cabling is slated to grow so rapidly that it will very likely overwhelm today's pool of qualified installers. For that reason,

BICSI, NECA, as well as cable and cabinet manufacturers are offering training programs to low-voltage installers and electricians on residential structured cable installation, termination and testing techniques.

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